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FIG. 1

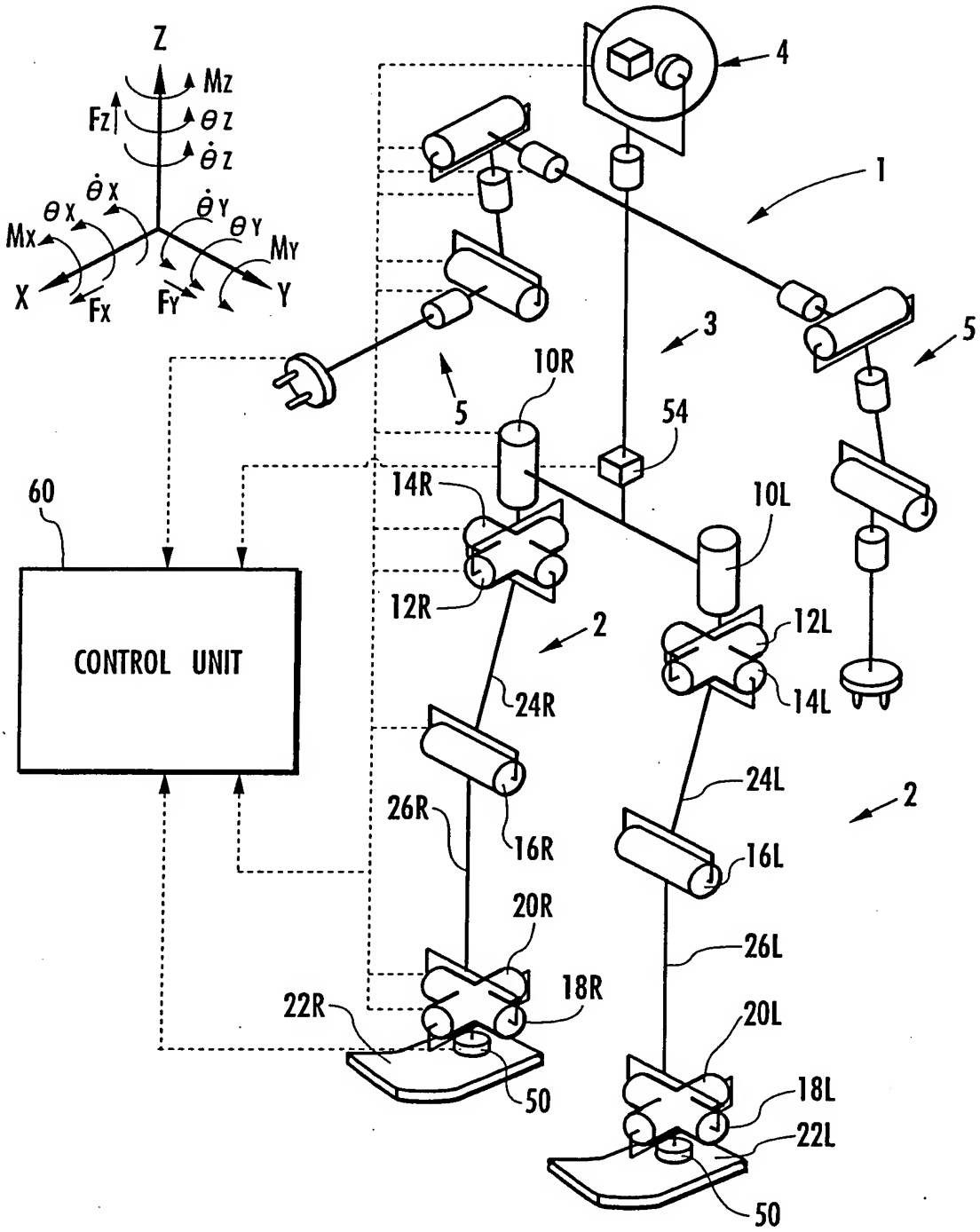

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FIG. 2

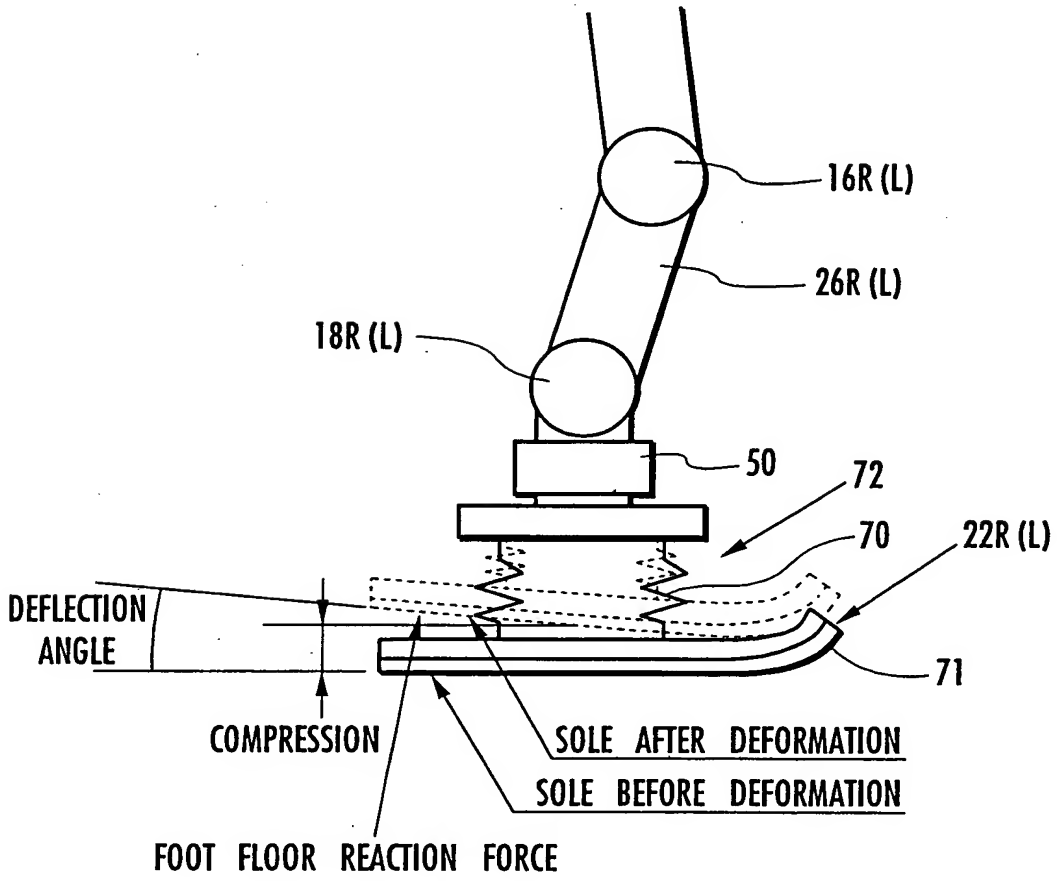

FIG. 3

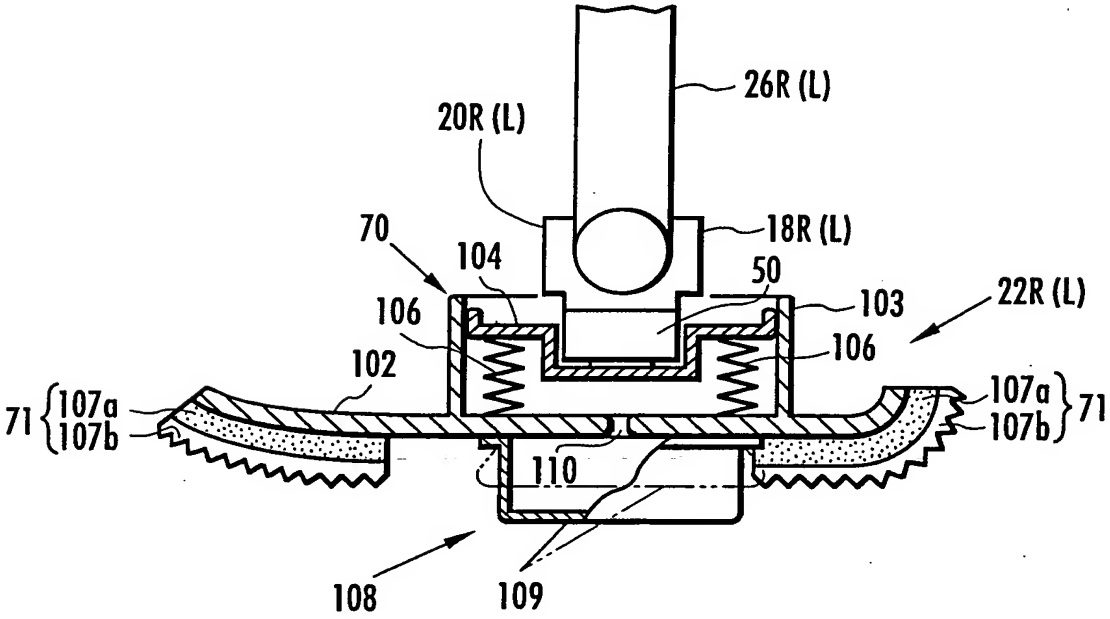
26R (L)
20R (L)
18R (L)
70
104
50
106
103
22R (L)
106
102
71
107a
107b
107a
107b
71
110
108
109

FIG. 4

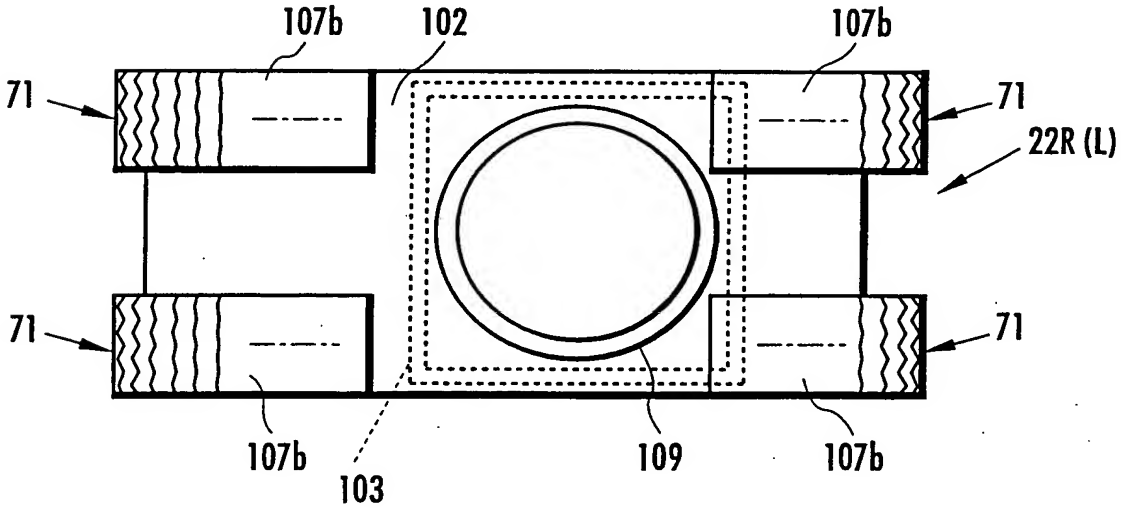
107b
102
107b
71
71
22R (L)
71
71
107b
103
109
107b

FIG. 5

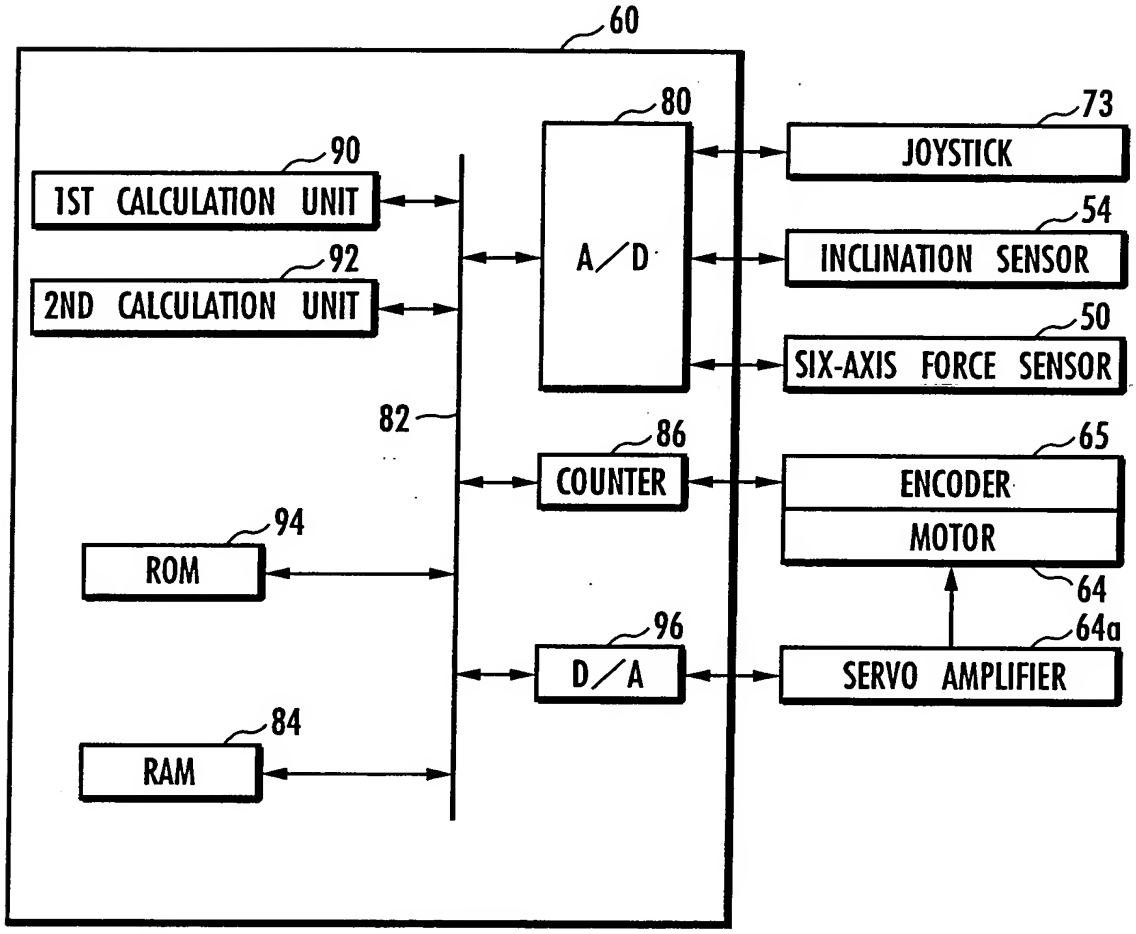

FIG.6

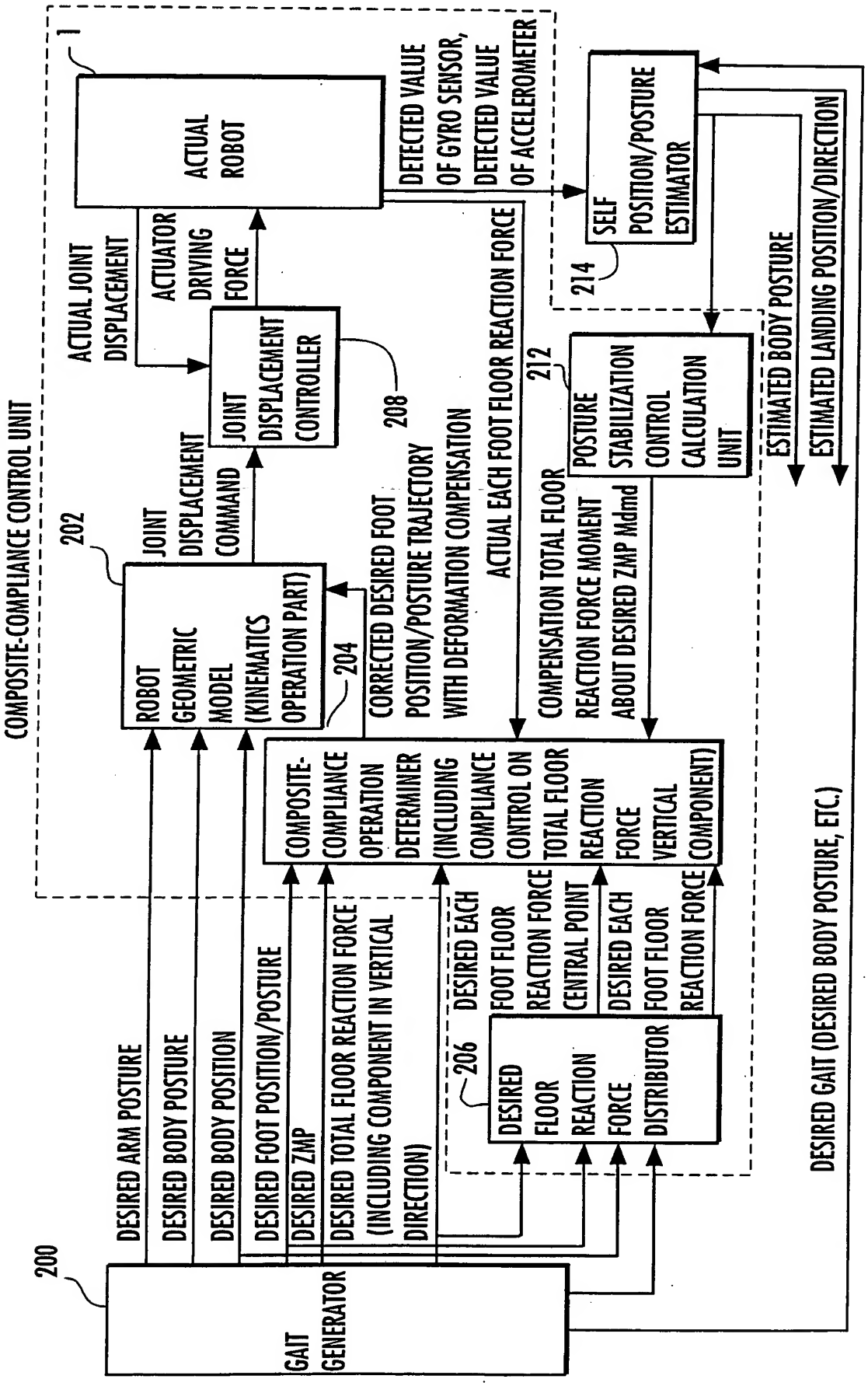
COMPOSITE-COMPLIANCE CONTROL UNIT
1
ACTUAL ROBOT
DETECTED VALUE OF GYRO SENSOR, DETECTED VALUE OF ACCELEROMETER
SELF POSITION/POSTURE ESTIMATOR
214
ACTUAL JOINT DISPLACEMENT
ACTUATOR DRIVING FORCE
JOINT DISPLACEMENT CONTROLLER
208
212
POSTURE STABILIZATION CONTROL CALCULATION UNIT
ESTIMATED BODY POSTURE
ESTIMATED LANDING POSITION/DIRECTION
202
JOINT DISPLACEMENT COMMAND
ROBOT GEOMETRIC MODEL (KINEMATICS OPERATION PART)
204
CORRECTED DESIRED FOOT POSITION/POSTURE TRAJECTORY WITH DEFORMATION COMPENSATION
ACTUAL EACH FOOT FLOOR REACTION FORCE
COMPENSATION TOTAL FLOOR REACTION FORCE MOMENT ABOUT DESIRED ZMP Mdmd
COMPOSITE-COMPLIANCE OPERATION DETERMINER (INCLUDING COMPLIANCE CONTROL ON TOTAL FLOOR REACTION FORCE VERTICAL COMPONENT)
DESIRED ARM POSTURE
DESIRED BODY POSTURE
DESIRED BODY POSITION
DESIRED FOOT POSITION/POSTURE
DESIRED ZMP
DESIRED TOTAL FLOOR REACTION FORCE (INCLUDING COMPONENT IN VERTICAL DIRECTION)
206
DESIRED EACH FOOT FLOOR REACTION FORCE CENTRAL POINT
DESIRED EACH FOOT FLOOR REACTION FORCE
DESIRED FLOOR REACTION FORCE DISTRIBUTOR
200
GAIT GENERATOR
DESIRED GAIT (DESIRED BODY POSTURE, ETC.)

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FIG. 7

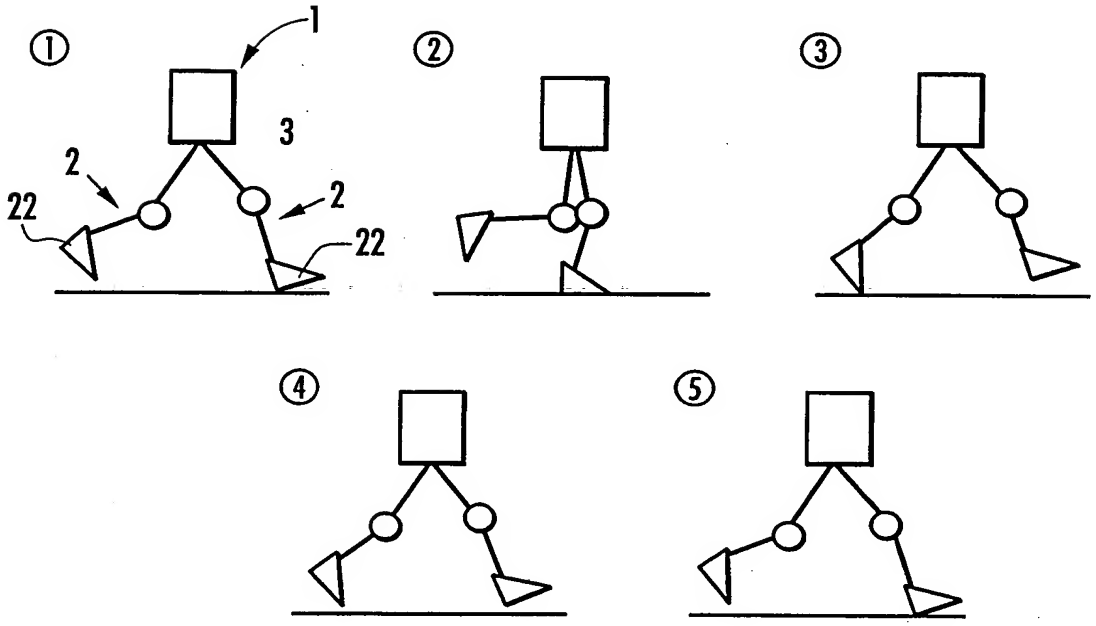

FIG.8 (a)

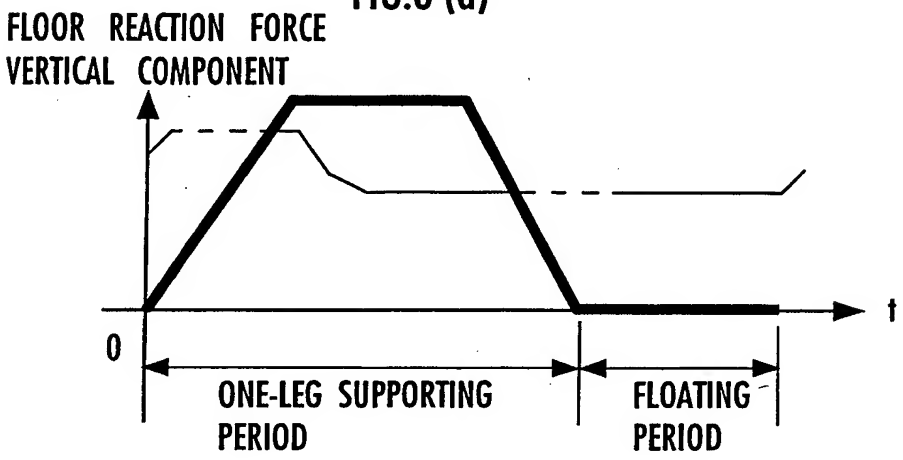

FIG.8 (b)

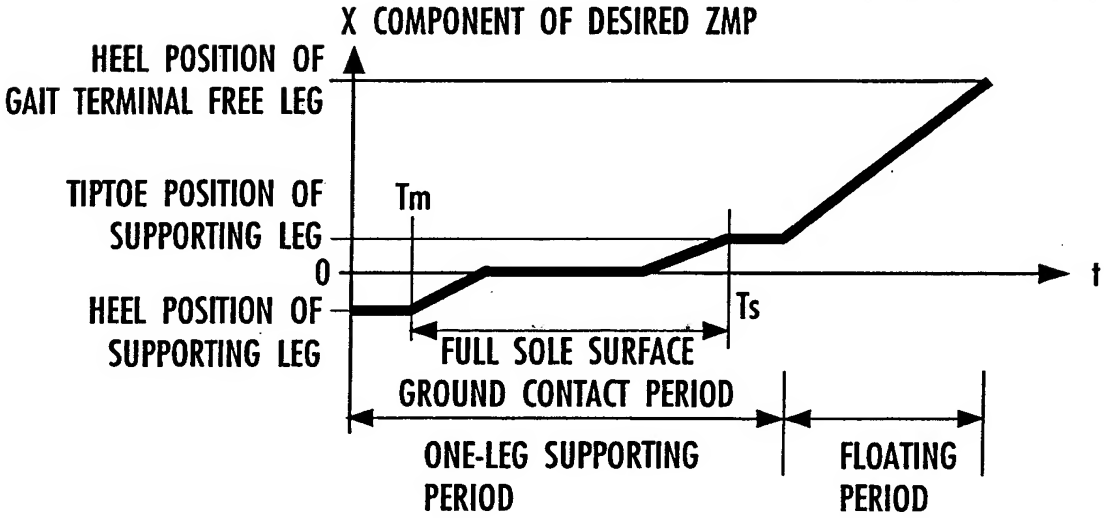

FIG.8 (c)

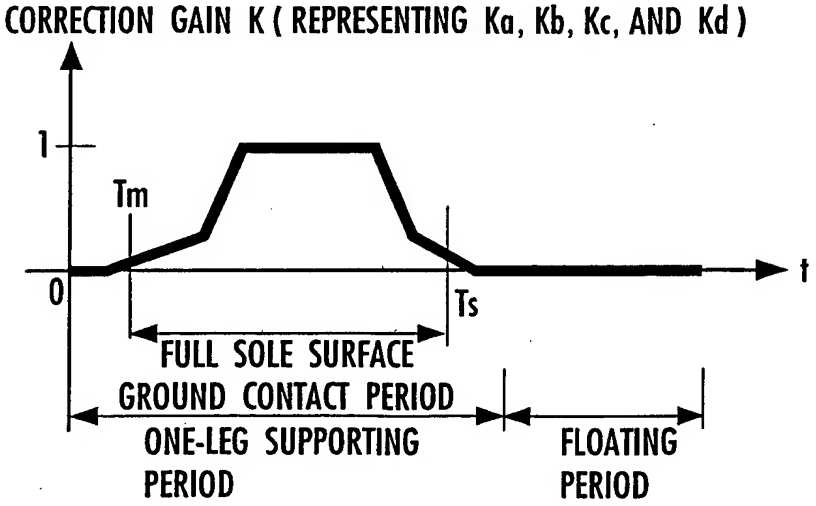

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FIG. 9

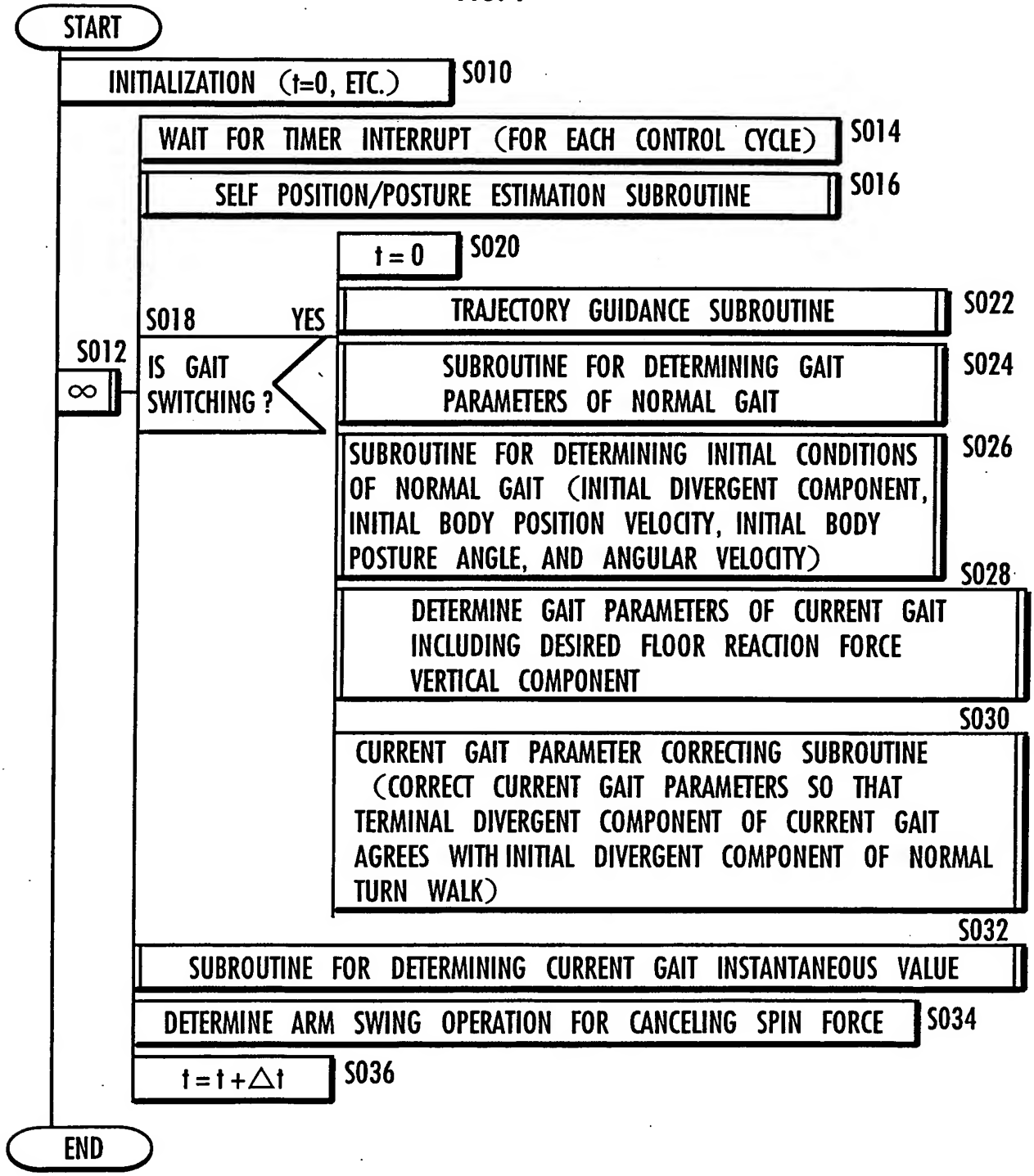

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FIG. 10

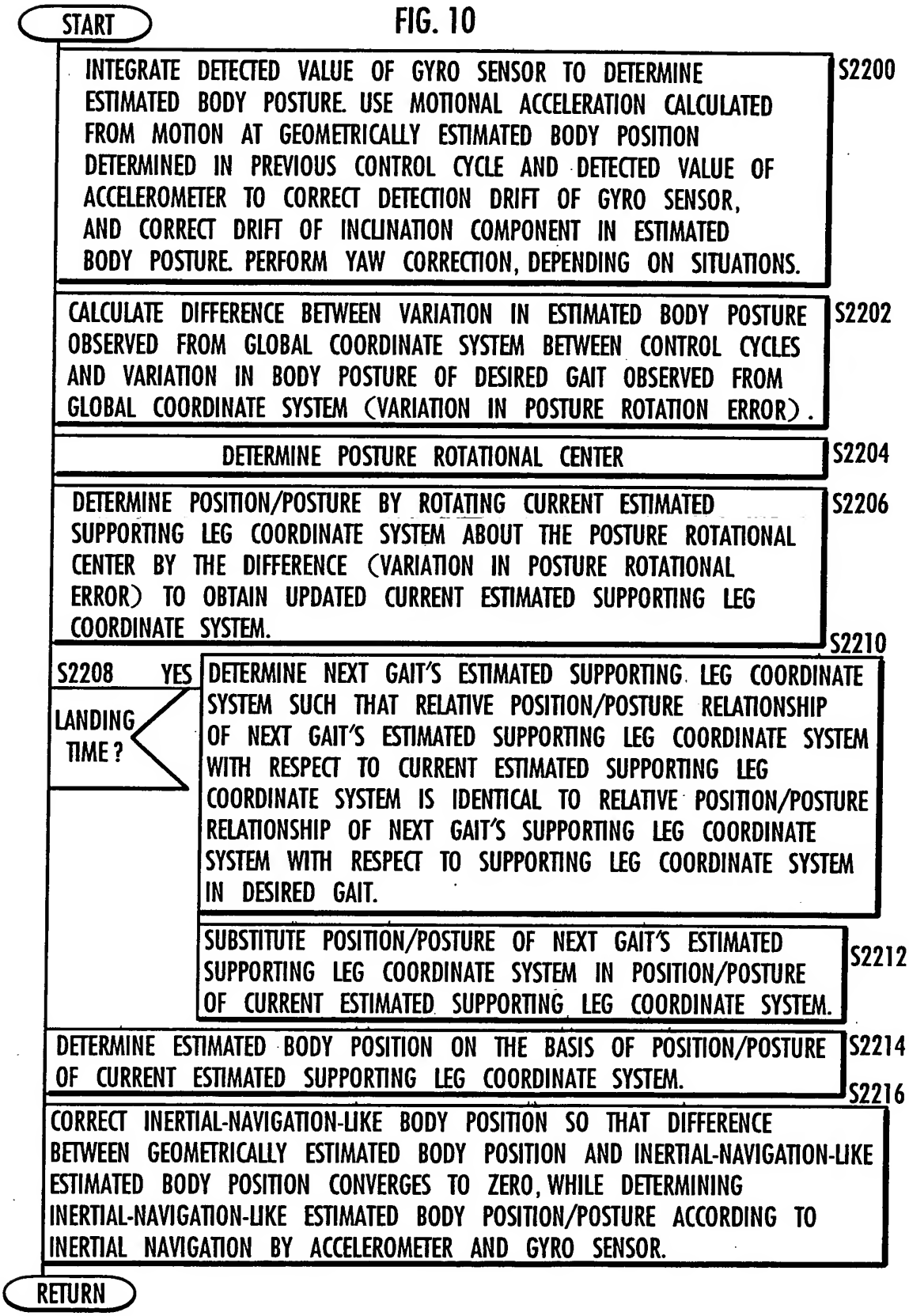

FIG. 11

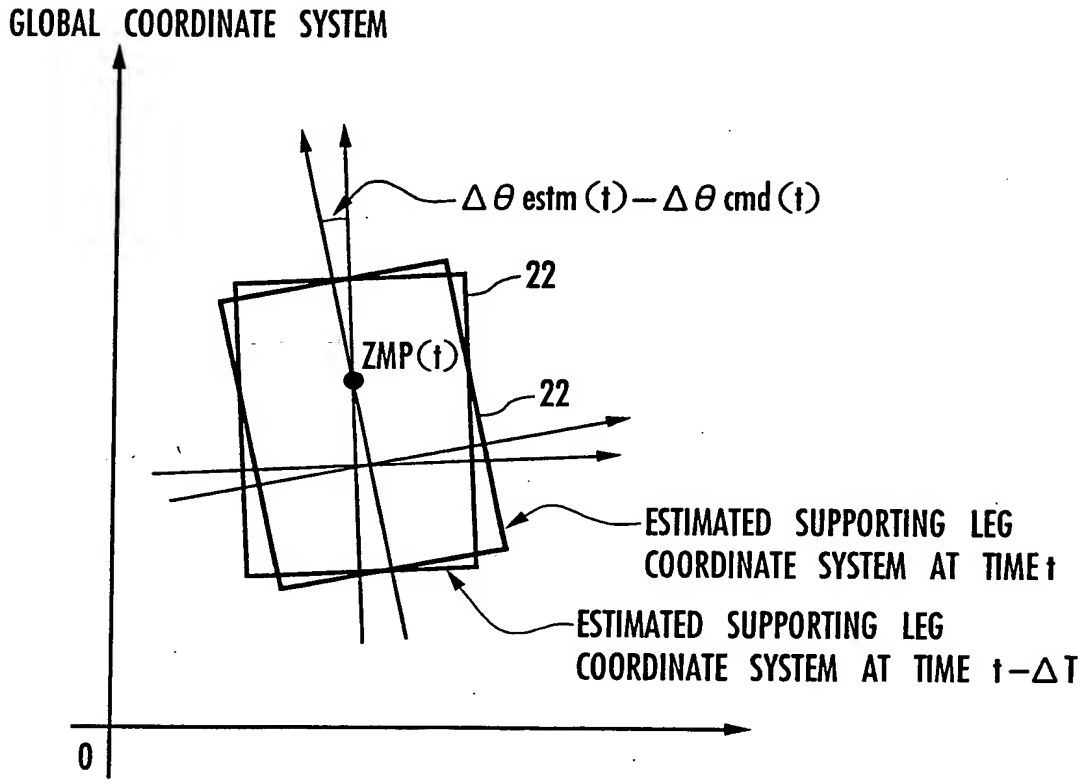
GLOBAL COORDINATE SYSTEM
Δθ estm (t) − Δθ cmd (t)
22
ZMP(t)
22
ESTIMATED SUPPORTING LEG COORDINATE SYSTEM AT TIME t
ESTIMATED SUPPORTING LEG COORDINATE SYSTEM AT TIME t−ΔT
0

FIG.12

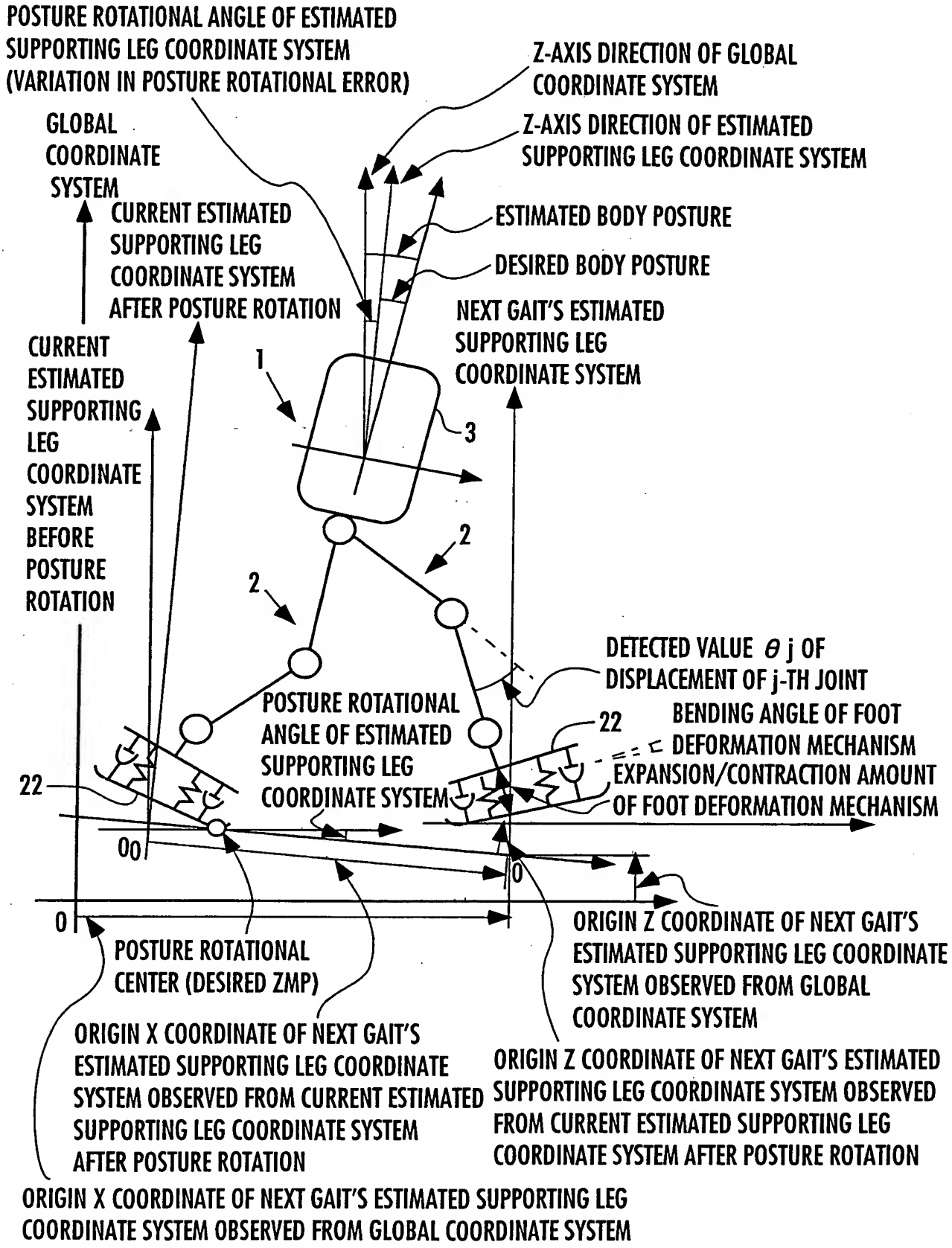
POSTURE ROTATIONAL ANGLE OF ESTIMATED SUPPORTING LEG COORDINATE SYSTEM (VARIATION IN POSTURE ROTATIONAL ERROR)
Z-AXIS DIRECTION OF GLOBAL COORDINATE SYSTEM
Z-AXIS DIRECTION OF ESTIMATED SUPPORTING LEG COORDINATE SYSTEM
GLOBAL COORDINATE SYSTEM
CURRENT ESTIMATED SUPPORTING LEG COORDINATE SYSTEM AFTER POSTURE ROTATION
ESTIMATED BODY POSTURE
DESIRED BODY POSTURE
NEXT GAIT'S ESTIMATED SUPPORTING LEG COORDINATE SYSTEM
CURRENT ESTIMATED SUPPORTING LEG COORDINATE SYSTEM BEFORE POSTURE ROTATION
1
2
2
3
DETECTED VALUE θj OF DISPLACEMENT OF j-TH JOINT
22
BENDING ANGLE OF FOOT DEFORMATION MECHANISM
EXPANSION/CONTRACTION AMOUNT OF FOOT DEFORMATION MECHANISM
POSTURE ROTATIONAL ANGLE OF ESTIMATED SUPPORTING LEG COORDINATE SYSTEM
22
00
0
0
POSTURE ROTATIONAL CENTER (DESIRED ZMP)
ORIGIN Z COORDINATE OF NEXT GAIT'S ESTIMATED SUPPORTING LEG COORDINATE SYSTEM OBSERVED FROM GLOBAL COORDINATE SYSTEM
ORIGIN X COORDINATE OF NEXT GAIT'S ESTIMATED SUPPORTING LEG COORDINATE SYSTEM OBSERVED FROM CURRENT ESTIMATED SUPPORTING LEG COORDINATE SYSTEM AFTER POSTURE ROTATION
ORIGIN Z COORDINATE OF NEXT GAIT'S ESTIMATED SUPPORTING LEG COORDINATE SYSTEM OBSERVED FROM CURRENT ESTIMATED SUPPORTING LEG COORDINATE SYSTEM AFTER POSTURE ROTATION
ORIGIN X COORDINATE OF NEXT GAIT'S ESTIMATED SUPPORTING LEG COORDINATE SYSTEM OBSERVED FROM GLOBAL COORDINATE SYSTEM

FIG.13

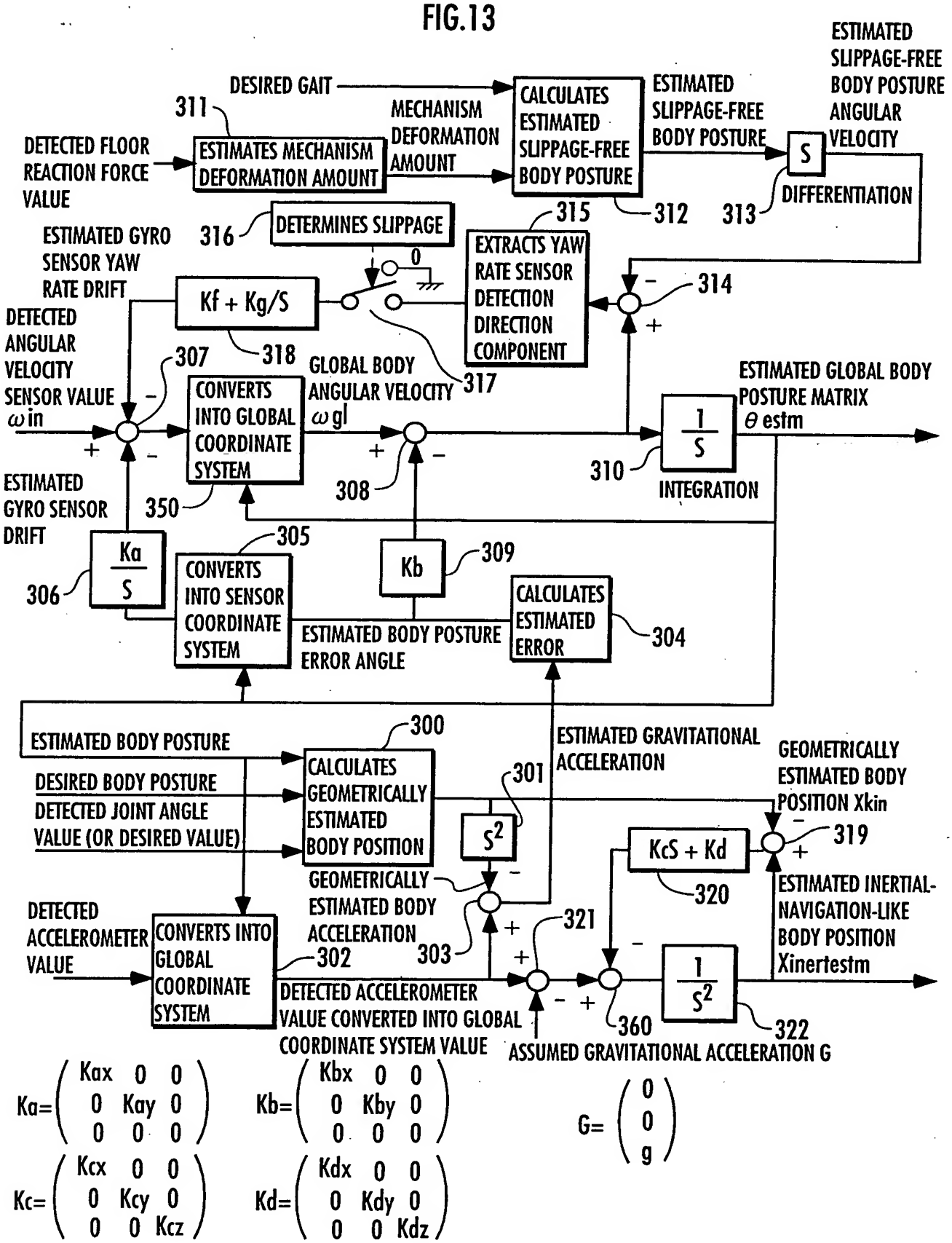

FIG.14 (a)

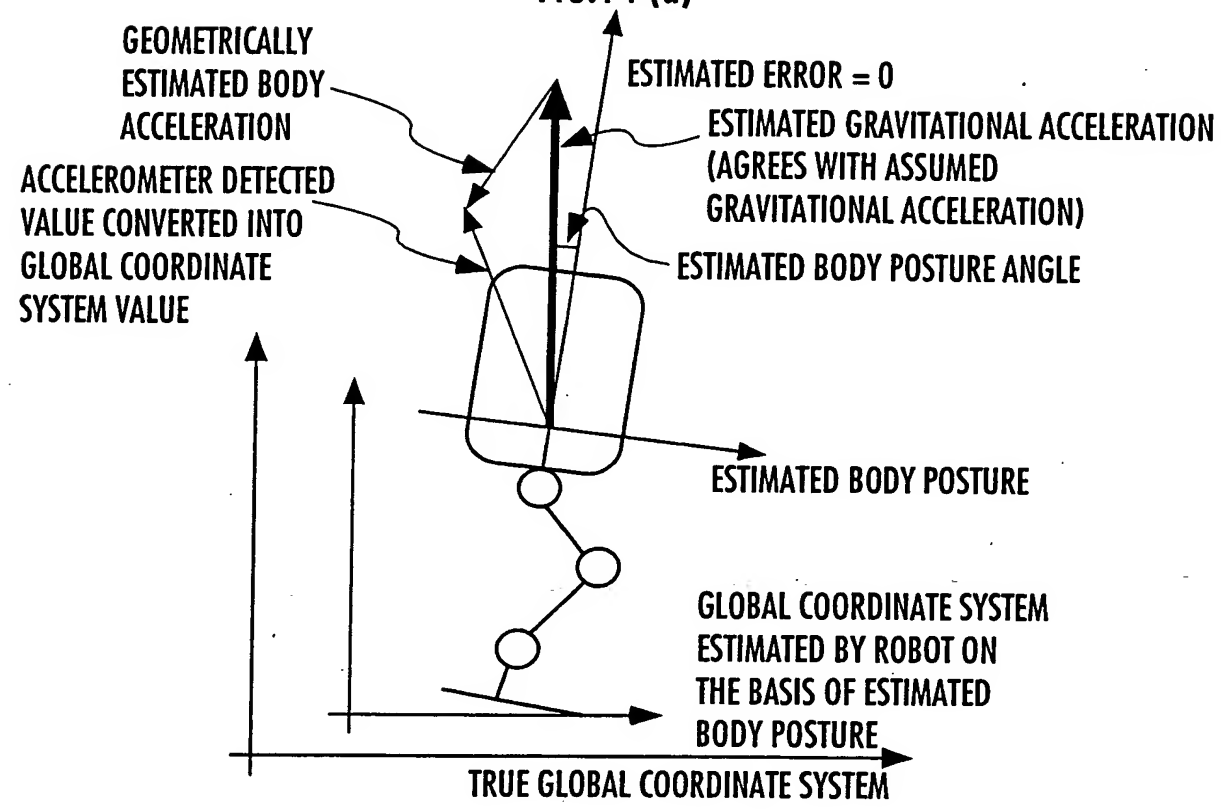

FIG.14 (b)

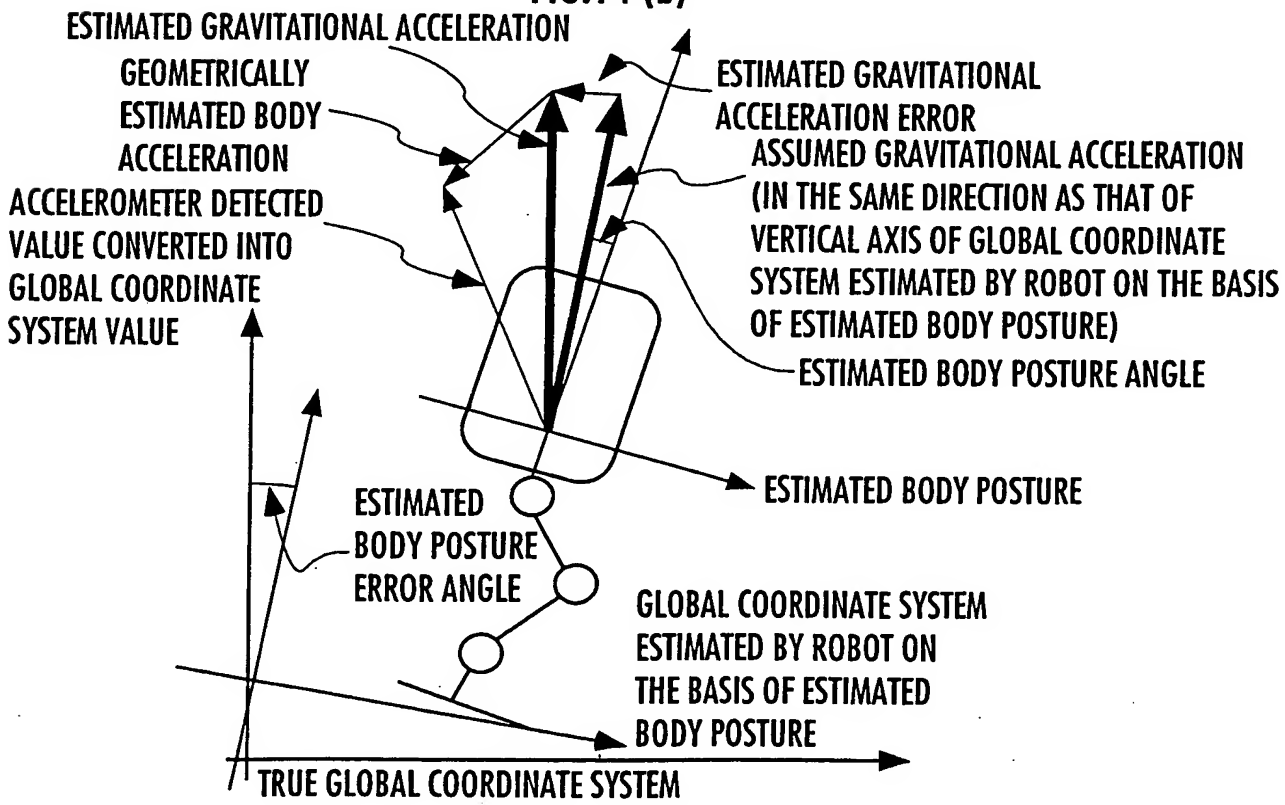

FIG. 15